

69326 - Radiotherapy technologies

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	547 - Master's in Biomedical Engineering
ECTS	3.0
Year	1
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It is based on the Problem-Based Learning method (PBL) which is a student-centered pedagogy for students to learn about a topic through the experience of solving an open-ended problem.

5.2.Learning tasks

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The course includes the following learning tasks:

- A01 Lectures. The main course contents are presented. Student participation is encouraged.
- A02 Practice sessions. Different practical activities and tasks are proposed related to the main contents of the course.
- A03 Computer lab sessions. Different lab sessions are carried out.
- A04 Visit to a clinical center.
- A05 Assignment. Students must submit a written report on a research topic.
- A09 Assessment. The reports derived from the practical activities and the final exam will be evaluated.

5.3.Syllabus

The course will address the following topics:

1. Introduction and general concepts of radiation therapy.
2. Radiation Models. Pencil Beam Dose Calculation Algorithm.
3. Intensity-modulated radiotherapy (IMRT) planning. Constrained Optimization.
4. Delivery of Fluence Map. Multileaf collimator: Segments and Monitor Unit.

5.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

5.5.Bibliography and recommended resources

BC	Ling,C. A practical guide to intensity-modulated radiation therapy / C. Ling et al. Madison : Medical Physics Publishing, 2003
BC	Van Dyk, J. The modern technology of radiation oncology / J. Van Dyk et al. Madison : Medical Physics Publishing, 2005
BC	Hindi, Haitham. A Tutorial on Optimization Methods for Cancer Radiation Treatment Planning". American Control Conference (ACC) , 2013

LISTADO DE URLs:

"A Tutorial on Radiation Oncology and Optimization", Tutorials on Emerging Methodologies and Applications in Operations Research, H. Greenberg, 2004
[\[http://digitalcommons.trinity.edu/cgi/viewcontent.cgi?article=1037&context=math_faculty\]](http://digitalcommons.trinity.edu/cgi/viewcontent.cgi?article=1037&context=math_faculty)
 "Descripción de equipos de última generación en radioterapia externa", S. Pellejero, S. Lozares, F. Mañeru, 2009.
[\[http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1137-66272009000400002\]](http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1137-66272009000400002)